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REMARKS

This amendment is responsive to the Office Action dated May 3, 2002. Applicant has amended claims 1, 3, 4, 11, 14, 15 and 19, and added new claims 29-35. Claims 1-35 are now pending. A complete copy of the claims showing changes made to the amended claims pursuant to 37 CFR § 1.121(c)(ii) is attached. In the attached version showing changes to the claims, Applicant has used underlines to indicate inserted matter and strikeouts to indicate deleted matter.

Claim Rejection Under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 1-28 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Examiner stated that the claims do not specify if the desired land and groove orientation corresponds to a final molded/embossed substrate or to a stamper. In response, Applicant has amended the independent claims to clarify that the pattern formed on the master is an inverse of a desired replica disk pattern to be formed in a replica disk.

In addition, with respect to claims reciting widths or depths, the Examiner stated that it is unclear whether the widths and depths correspond to each of the lands and grooves. In response, Applicant has amended claims 3 and 14 to specify that at least some of the inverse pattern of specified grooves have a depth greater than 50 nanometers, and amended claims 4 and 15 to specify that at least some of the inverse pattern of specified lands have a width greater than 150 nanometers.

The Examiner also rejected claim 28 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Applicant traverses the rejection. The claimed feature of a flat master groove bottom having a width greater than 100 nanometers defined by the master substrate is clearly supported by FIG. 12 of Applicant's original specification. Accordingly, the rejection is improper and should be withdrawn.

Claim Rejections Under 35 U.S.C. § 102 and § 103

In the Office Action, the Examiner rejected claims 1, 2, 4, 5, 8, 11-13, 15, 16, 19-21 and 27-28 under 35 U.S.C. 102(e) as being fully anticipated by Yamada et al. '267; rejected claims 1-6, 8, 11-16, 19-21, 24 and 27-28 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamada et al. '267; rejected claims 1-5, 8, 11-16, 19-21 and 27-28 under 35 U.S.C. 102(b) as anticipated by JP 59-193560; rejected claims 1-5, 11-15, 19, 20 and 27-28 under 35 U.S.C. 102(b) as being anticipated by JP 60-029950; rejected claims 1-7, 11-15, 19, 20 and 24-28 under 35 U.S.C. 103(a) as being unpatentable over JP 60-029950; rejected claims 1-5, 8-23 and 27-28 under 35 U.S.C. 102(b) as being anticipated by DeLaat '735; and rejected claims 1-28 under 35 U.S.C. 103(a) as being unpatentable over DeLaat '735, in view of JP 60-029950 and Santoh et al. '469.

Applicant traverses the rejections. In all instances, the Examiner has failed to establish a prima facie case of anticipation or obviousness. None of the applied references discloses or suggests creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. Applicant disagrees with the Examiner's assertion that the language concerning the inverse of the desired lands and grooves is merely intended use. On the contrary, Applicant's claim language concerning the inverse of the desired lands and grooves is a structural limitation that should be given patentable consideration. In particular, the claim language concerning the inverse of the desired lands and grooves quantifies the pattern to be created in the master disk in a manner that distinguishes the applied references. For this reason, the Examiner's dismissal of the claim limitation is inappropriate.

The Examiner apparently concluded that the mere recitation of the creation of father/mother/son stampers as described, for example, in De Laat (column 3, line 46 to column 4, line 10) would have led a person with ordinary skill in the art to create a master that includes features that are inverse of desired features to be created in a replica disk. In other words, the Examiner seems to have concluded that De Laat contemplated the use of the mother stamper (second generation stamper) to create replica disk. In that case, the Examiner must have assumed that the replica disk would define a pattern that is inverse of the pattern created in the master.

De Laat, however, does not teach or suggest using the mother stamper (second generation stamper) to create replica disks. Quite the opposite, De Laat states at column 3, lines 46 to 55:

> The metal matrix obtained according to the invention which is derived from the master disc may be used for the production of the information carriers formed of synthetic resin. It is to be preferred, however, to manufacture from this matrix, which is sometimes called father matrix, further metal copies by electrodeposition (mother matrix) which in their turn are again copied by electrodeposition so as to obtain the so-called son matrices or dies. **The latter are then used for the manufacture of information discs of synthetic resin.** (Emphasis added)

Furthermore, De Laat reiterates at column 5, lines 27-32, that the son matrix (third generation stamper) can be used to make information carriers of synthetic resin (replica disks), but conspicuously excludes any mention of using a mother matrix (second generation stamper) to create information carriers.

Why does De Laat state that the mother matrix is used to create a son? Why does De Laat state that "the latter (i.e., the son) is then used for the manufacture of information disks?" And most importantly, why doesn't De Laat state that the mother can be used to create information disks? The answer to these questions are evident: De Laat does not state that the mother can be used to create information disks, because De Laat did not contemplate the use of the mother matrix to create information disks. Accordingly, De Laat also did not contemplate the creation of an inverse pattern in the master as recited in Applicant's claims. Thus, one of ordinary skill in the art, upon review of De Laat, would have had no notion of the desirability of such a feature.

The other applied references are similar to De Laat in that they do not disclose or suggest the creation of a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. The Examiner has argued embossed substrates resulting for the use of either first (odd) or second (even) generation stampers would be useful as evidenced by JP 60-029950 which shows the master itself can be used as a substrate. This statement by the Examiner, however, bolsters Applicant's argument. If JP 60-029950 shows the master being used as a substrate, then the master of JP 60-029950 has the same pattern as replica disks, and not the inverse pattern as recited in Applicant's claims.

Applicant's disclosure is the first such disclosure of the novel, non-obvious, and advantageous feature of creating a pattern in a master to have an orientation that is inverse of a desired pattern for replica disks. As noted in Applicant's specification, advantages of this feature may include the ability to define the tops of replica lands by the flat substrate that corresponds to

the bottom of the master grooves, and flyability advantages in the replica disk ultimately molded or embossed from a master created by Applicant's inventive mastering process.

The Examiner has failed to cite a single reference that describes or suggests creating an inverse pattern on a master. Instead, the Examiner has ignored the lack of evidence in the prior art, and asserted that defining an inverse of a pattern would be an intended use. However, as illustrated above, Applicant's claimed feature concerning the creation of an inverse pattern in the master is a structural limitation that quantifies the pattern on the master. Without specific teaching in the prior art of the claimed feature of creating an inverse pattern, a person with ordinary skill in the art would have understanding of how to make the "intended use."

The Examiner has asserted that Applicant's independent claims are separately anticipated by Yamada '267, JP 59-193560, JP 60-029950, and DeLaat '735. However, the Examiner rejected many of the same independent claims as being obvious in light of the same references. Thus, the Examiner is apparently arguing that each of the Yamada '267, JP 59-193560, JP 60-029950, and DeLaat '735 references discloses all of the features of Applicant's independent claims, and also that one or more of the references do not disclose every feature. For this reason, Applicant is unclear concerning the Examiner's rationale underlying the rejections.

With regard to the four separate anticipation rejections in the Office Action, based respectively on Yamada '267, JP 59-193560, JP 60-029950, and DeLaat '735, the Examiner has failed to identify any language that describes creating on a master an inverse of a pattern of a desired pattern for the replica disks. For anticipation, it is well established that a single reference must disclose each and every element of the claim. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81 (CAFC 1986); see also *Apple Computer Inc. v. Articulate Systems, Inc.*, 57 USPQ2d 1057 (CAFC 2000). This is commonly referred to as the *"all elements rule."* If, as the Examiner states, Applicant's claims are clearly anticipated by the four separate references, then the Examiner must be able to point to specific language in each reference that discloses a master created to have features that are the inverse of desired features to be created in a replica disk. However, neither Yamada '267, JP 59-193560, JP 60-029950, nor DeLaat '735 discloses or suggests such a feature. Therefore, the rejections under section 102 are improper and should be withdrawn.

In addition to rejecting Applicant's independent claims under section 102, the Examiner has rejected many of the same claims under section 103, apparently recognizing that the cited references do not disclose each and every feature of Applicant's claims. For obviousness under section 103, it is well established that the Examiner bears the burden of establishing a prima facie case. *In re Oetiker*, 24 USPQ2d 1443, 1445 (CAFC 1992). In doing so, the Examiner must determine whether the prior art provides a "teaching or suggestion to one of ordinary skill in the art to make the changes that would produce" the claimed invention. *In re Chu*, 36 USPQ2d 1089, 1094 (CAFC 1995). A prima facie case of obviousness is established only when this burden is met.

The Examiner's assertion that "the language concerning the inverse of the desired lands and grooves is considered intended use" falls far short of meeting this burden. As indicated above, the claim language related to the inverse of the desired lands and grooves quantifies the pattern created on the master in a manner that distinguishes the applied references. The Court of Appeals for the Federal Circuit recently addressed the evidentiary standard required to uphold an obviousness rejection in the case of *In re Lee*, 61 USPQ2d 1430 (CAFC 2002). In that case, the Federal Circuit stated: "[the] factual question of motivation is material to patentability, and (can) not be resolved on subjective belief and unknown authority. *Id.* at 1434.

In short, the claim limitation concerning the creation of a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks should be given patentable consideration by the Examiner as it quantifies the pattern of the master in a manner that distinguishes the applied references. None of the applied references disclose or suggest creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. Moreover, none of the applied references provide motivation to one with skill in the art to incorporate such features in a master. For these reasons, the Examiner's rejections under sections 102 and 103 are inappropriate and should be withdrawn.

Applicant has added new claims 29-35, which also include the limitation of creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. Claims 29-35 should be allowed for at least the reasons listed above. In addition, claims 29-35 further define the process in which the master disk is used to create a first generation stamper, the first generation stamper is used to create a second generation stamper, and the

second generation stamper is used to create replica disks. This two-generation stamper process is clearly not disclosed in the applied references in combination with the creation of a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks.

Applicant's claims currently define a number of features that are not disclosed or suggested in the applied references. First, as outlined above, none of the applied references discloses or suggests creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. This feature is included in every independent claim.

Second, none of the applied references discloses or suggests the combination of creating an inverse pattern in the master disk, and at the same time creating grooves in the pattern that extend down to the master disk substrate to define flat master groove bottoms. Claims 12, 13, 20, 27, 28 and new claims 30 and 34 all require both creating an inverse pattern in the master, and creating a substantially flat groove bottom. The Examiner has argued that De Laat shows the creation of grooves down to the master disk substrate. Although Applicant disagrees with the Examiner about whether De Laat actually teaches this feature, Applicant notes that De Laat clearly does not disclose or suggest the combination of creating an inverse pattern in the master disk, and at the same time creating grooves in the pattern that extend down to the master disk substrate to define flat master groove bottoms. To be sure, De Laat makes absolutely no mention of creating an inverse pattern. On the contrary, De Laat describes the use of first generation stampers (father matrices) and third generation stameprs (son matrices), but excludes mention of use of second generation stampers (mother matrices). A person with ordinary skill in the art, reading De Laat, would have no reason to create an inverse pattern in the master disk, much less create grooves in the *inverse pattern* that extend down to the master disk substrate to define flat master groove bottoms. For these additional reasons, claims 12, 13, 20, 27, 28 and new claims 30 and 34 are patentable over the applied references.

Third, none of the applied references disclose or suggest the creation of lands on the master to have rounded tops as recited in new claim 33. The Examiner noted this fact in the Office Action at page 4, the first full paragraph.

Applicant respectfully requests further consideration by the Examiner. With further consideration, Applicant believes that the Examiner will recognize that the applied references fail to disclose or suggest the novel and non-obvious features of Applicant's claims. In particular, the

applied references fail to disclose or suggest the creation of a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks. Additionally, the applied references do not disclose or suggest the combination of the creation of an inverse pattern in a master, and at the same time the creation of grooves in the pattern that extend down to the master disk substrate to define flat master groove bottoms.

In light of the amendments and remark submitted above, Applicant requests prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 09-0069. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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VERSION SHOWING CHANGES TO THE CLAIMS

1. (Amended) A method of making a data storage disk master comprising:

providing a master substrate;

specifying a photosensitive material layer thickness;

providing a layer of photosensitive material on the master substrate, the layer having an initial thickness corresponding to the specified photosensitive material layer thickness;

controlling optical exposure to the layer of photosensitive material; and

controlling development criteria of the layer of photosensitive material,

wherein specifying a photosensitive material layer thickness, controlling optical exposure and controlling development criteria collectively control the creation on the master of an inverse of a desired replica disk pattern to be formed in a replica disk on the master.

2. The method of claim 1, wherein the inverse of the desired replica disk pattern includes an inverse of desired lands and grooves.

3. (Amended) The method of claim 2, wherein at least some of the inverse of desired lands and grooves have a depth greater than 50 nanometers.

4. (Amended) The method of claim 2, wherein at least some of the inverse of desired lands and grooves have a width greater than 150 nanometers.

5. The method of claim 1, wherein the inverse of the desired replica disk pattern includes an inverse of desired surface variations.

6. The method of claim 5, wherein at least some of the inverse of desired surface variations have a depth of less than 50 nanometers.

7. The method of claim 5, wherein at least some of the inverse of desired surface variations have a width less than 150 nanometers.

8. The method of claim 1, further comprising creating a first-generation stamper from the master.

9. The method of claim 8, further comprising creating a second-generation stamper from the first-generation stamper.

10. The method of claim 9, further comprising creating flyable media exhibiting surface variations using the second-generation stamper.

11. (Amended) A method of making a data storage disk master comprising:

providing a master substrate;

specifying a thickness of photosensitive material;

coating the master substrate with the specified thickness of photosensitive material;

exposing the photosensitive material to a controlled amount of optical energy; and

exposing the photosensitive material to developer solution,

wherein the specified thickness of photosensitive material, the controlled amount of optical energy, and the exposure to developer solution collectively define on the master an inverse pattern of specified lands and grooves to be created in a replica disk on the master.

12. The method of claim 11, wherein the inverse pattern has a substantially flat groove bottom.

13. The method of claim 12, wherein the substantially flat groove bottom is defined by a surface of the master substrate.

14. (Amended) The method of claim 11, wherein at least some of the inverse pattern of specified lands and grooves haves a depth greater than 50 nanometers.

15. (Amended) The method of claim 11, wherein at least some of the inverse pattern of specified lands ~~and grooves~~ has a width greater than 150 nanometers.

16. The method of claim 11, further comprising creating a first-generation stamper from the master.

17. The method of claim 16, further comprising creating a second-generation stamper from the first-generation stamper.

18. The method of claim 17, further comprising creating flyable media using the second-generation stamper.

19. (Amended) A method of making a data storage disk master comprising:

providing a master substrate;

specifying a thickness of photosensitive material;

coating the master substrate with the specified thickness of photosensitive material;

exposing the photosensitive material to a controlled amount of optical energy; and

exposing the photosensitive material to developer solution,

wherein the specified amount of photosensitive material, the controlled amount of optical energy, and exposure to the developer solution collectively define a pattern on the master having an inverse of desired surface variations to be formed in a replica disk.

20. The method of claim 19, wherein the pattern having an inverse of desired surface variations has a flat master bottom defined by a surface of the substrate.

21. The method of claim 19, further comprising creating a first-generation stamper from the master.

22. The method of claim 21, further comprising creating a second-generation stamper from the first-generation stamper.

23. The method of claim 22, further comprising creating flyable media that exhibit surface variations using the second-generation stamper.

24. The method of claim 19, wherein at least part of the pattern having an inverse of desired surface variations has a depth less than 50 nanometers.

25. The method of claim 20, wherein at least part of the pattern having an inverse of desired surface variations has a depth less than 25 nanometers.

26. The method of claim 20, wherein at least part of the pattern having an inverse of desired surface variations has a width less than 150 nanometers.

27. A method of making a data storage disk master for use in a reverse mastering, data storage disk molding process, the data storage disk master including master lands and master grooves, wherein the data storage disk molding process produces replica disks having a surface relief pattern with replica lands and replica grooves, the surface relief pattern having an orientation which is the inverse of the data storage disk master, the method comprising the steps of:

providing a master substrate;

covering the master substrate with a layer of photosensitive material;

recording a surface relief pattern having master lands and master grooves in the data storage disk master, including the steps of exposing and developing the photosensitive material; and

controlling the exposing and developing of a specified thickness of photosensitive material to form master grooves extending down to a substrate interface between the master substrate and the layer of photosensitive material, such that the width of the master grooves at the substrate interface corresponds to a desired width of the replica lands, including the step of exposing the photosensitive material to obtain a wide flat master groove bottom defined by the master substrate, relative to a master land top.

28. A method of making a disk master for use in making a replica disk in an inverse stamping process, the replica disk being capable of storing high volumes of information, the replica disk including a surface relief pattern with replica lands and replica grooves, the surface relief pattern having an orientation which is inverse of the disk master, the method comprising the steps of:

providing a master substrate;

coating at least a portion of the master substrate with a layer of photosensitive material to form the disk master;

recording a surface relief pattern having master lands and master grooves in the master disk, including the steps of using a laser beam recorder for exposing the photosensitive material in a desired track pattern having a track pitch, and developing the photosensitive material; and

controlling the exposing and developing of the photosensitive material for forming master grooves extending down to a substrate interface between the master substrate and the photosensitive material, such that the width of the master grooves at the substrate interface corresponds to a desired width of the replica lands, including the step of exposing the photosensitive material to obtain a wide, flat master groove bottom having a width greater than 100 nanometers defined by the master substrate, relative to a master lands top.

29. (New) A method comprising:

creating a master disk for use in a process in which the master disk is used to create a first generation stamper, the first generation stamper is used to create a second generation stamper, and the second generation stamper is used to create replica disks; and

creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks.

30. (New) The method of claim 29, wherein creating the pattern in the master disk having an orientation that is inverse of the desired pattern for the replica disks includes creating grooves in the master disk that correspond to lands to be created in the replica disks, wherein the grooves in the master disk extend down to a master disk substrate to define flat master groove bottoms such

that lands created in the replica disks have flat land tops that have an inverse orientation to the flat master groove bottoms in the master.

31. (New) The method of claim 30, wherein the flat master groove bottoms have a width greater than 100 nanometers defined by the master substrate.

32. (New) The method of claim 29, further comprising:

creating the first generation stamper using the master disk;

creating the second generation stamper using the first generation stamper; and

creating the replica disks using the second generation stamper, wherein the replica disks are formed with the desired pattern.

33. (New) The method of claim 29, wherein creating the pattern in the master disk having an orientation that is inverse of the desired pattern for the replica disks includes creating lands on the master that correspond to grooves to be created in the replica disks, wherein the lands on the master have rounded tops.

34. (New) The method of claim 33, wherein the grooves in the master disk extend down to a master disk substrate to define flat master groove bottoms.

35. (New) A method comprising:

creating a master disk;

creating a pattern in the master disk to have an orientation that is inverse of a desired pattern for the replica disks;

creating a first generation stamper using the master disk;

creating a second generation stamper using the first generation stamper; and

creating the replica disks using the second generation stamper, wherein the replica disks exhibit the desired pattern.